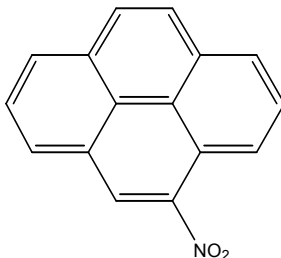


NITROARENES (SELECTED)

4-NITROPYRENE

CAS No. 57835-92-4

First Listed in the *Eighth Report on Carcinogens*



CARCINOGENICITY

4-Nitropyrene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of malignant tumor formation at multiple tissue sites in multiple species of experimental animals (reviewed in IARC V.46, 1989). Intraperitoneal (i.p.) injections of 4-nitropyrene caused an increased incidence of liver tumors in male mice, lung tumors in male and female mice (Wislocki et al., 1986; cited by IARC V.46, 1989), and mammary adenocarcinomas in female rats (Imaida et al., 1991a). When administered by subcutaneous (s.c.) injections, 4-nitropyrene induced sarcomas at the injection site, and increased incidences of mammary adenocarcinomas, leukemia and tumors of the Zymbal gland in female rats (Imaida et al., 1995; IARC V.46, 1989). In two studies, female rats receiving mammary gland injections of 4-nitropyrene showed an increased incidence of mammary tumors (Imaida et al., 1991a; El-Bayoumy et al., 1993).

There are no data available to evaluate the carcinogenicity of 4-nitropyrene in humans.

ADDITIONAL INFORMATION RELEVANT TO CARCINOGENESIS OR POSSIBLE MECHANISMS OF CARCINOGENESIS

Although not as reactive/potent as some of the mononitro- or dinitropyrenes, 4-nitropyrene is genotoxic in bacterial cells and induces cell transformation in BALB cells *in vitro*. Metabolic pathways for 4-nitropyrene, leading to mutagenic and likely DNA adducts, have also been described (IARC V.46, 1989).

No data are available that would suggest that the mechanisms thought to account for tumor induction by 4-nitropyrene in experimental animals would not also operate in humans.

PROPERTIES

4-Nitropyrene occurs as slender orange needles. It has a melting point of $\geq 190^{\circ}\text{C}$. When heated to decomposition, 4-nitropyrene emits toxic fumes of nitrogen oxides (NO_x).

USE

There is no evidence that 4-nitropyrene has been used for commercial applications (IARC V.46, 1989).

PRODUCTION

No evidence has been found that 4-nitropyrene has been produced for other than laboratory use (IARC V.46, 1989). One American company produces 4-nitropyrene (SRI, 1992), and Chem Sources identified one American supplier in 1989 (Chem Sources, USA, 1990). No data on imports or exports of 4-nitropyrene were available.

EXPOSURE

The primary route of potential human exposure to 4-nitropyrene is inhalation. Low concentrations of 4-nitropyrene were found in ambient airborne particulates in one study. Prior to 1980, some carbon black samples known to be used in photocopy machines were found to contain considerable quantities of nitropyrenes (IARC V.46, 1989). 4-Nitropyrene is not listed in the National Occupational Exposure Survey or the National Occupational Hazard Survey conducted by NIOSH.

REGULATIONS

OSHA regulates 4-nitropyrene under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-95.